5-14-1999

Quality of Life and Locus of Control of Migraineurs

Lesley L. Allen
San Jose State University

SAN JOSE STATE UNIVERSITY
SCHOOL OF NURSING

MASTER'S PROGRAM PROJECT OPTION (PLAN B)
PROJECT SIGNATURE FORM

STUDENT NAME Lesley Allen & Mojgan Haririfar

SEMESTER ENROLLED Spring 1999

TITLE OF PROJECT Quality of Life and Locus of Control of Migraineurs

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Running head: QUALITY OF LIFE OF MIGRAINEURS

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Lesley L. Allen, MS, RN, FNP

[redacted] Tel: [redacted]

e-mail: [redacted]

Staff RN, Kaiser Permanente Emergency Department

Mojgan Haririfar, MS, RN, FNP

[redacted] Tel: [redacted]

e-mail: [redacted]

Research Coordinator, Adult Renal Transplant Program,

Stanford University Medical Center

Jayne Cohen, DNSc, RNC, NP

Professor and Graduate Coordinator

School of Nursing

San Jose State University

San Jose, CA 95192-0057

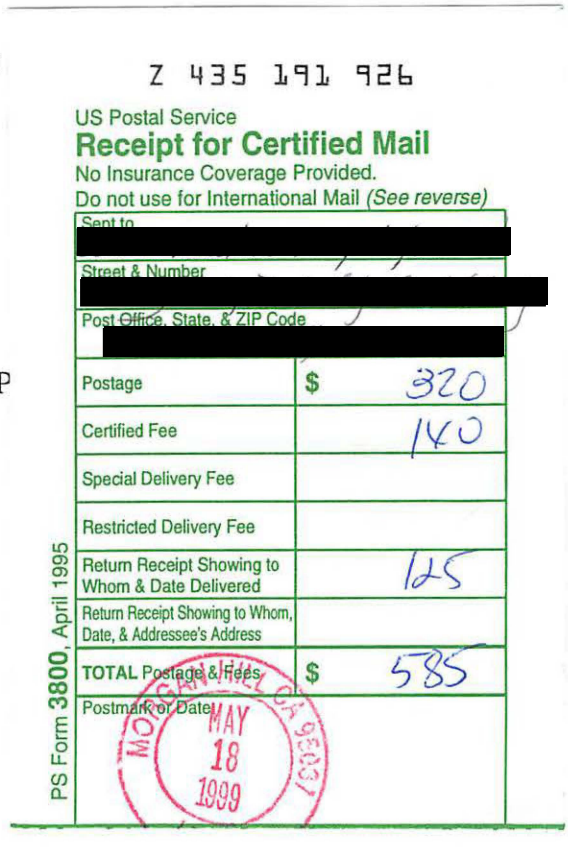
M. J. Henderson, MS, RN, CS, GNP

Faculty

School of Nursing

San Jose State University

San Jose, CA 95192-0057



Abstract

Advanced practice nurses are essential primary health care providers actively engaged in health promotion, illness prevention, and the management of acute and chronic diseases. The purpose of this study was to measure the quality of life and locus of control among three different groups of migraineurs. A retrospective quantitative study was conducted using Ferrans and Powers' (1985) Quality of Life Index and Martin, Holroyd, and Penzien's (1990) Headache Specific Locus of Control questionnaire. The analysis of 79 adult migraineurs indicated that those who received headache education had a higher quality of life and higher external locus of control scores than those without the intervention. This study's findings reinforces the notion that disease-specific education is an effective practice intervention . Advanced practice nurses can positively effect the quality of life for migraineurs by providing an educational intervention as part of high quality, accessible, and cost-effective primary care.

Key Words: advanced practice nurse, cost effectiveness, headache education, migraine.

Quality of Life and Locus of Control of Migraineurs

> "It starts slowly. Almost without warning. I could be driving, making dinner, or getting ready to give a patient an injection. Then it happens. The right side of my face gets numb, my speech becomes slurred, and I have scotomas. Within three to five minutes, I have altered vision and dizziness to the point that I have to stop everything. Everything. Ice sometimes helps, not always. If I am at work, I can usually find a quiet place to sit for a 15 minute break, sometimes this is enough time. Many times not, and I have to resume my duties to the best I can at the moment, certainly not up to my normal pace. There was a time that this would have only been the beginning of a torturous 12 to 18 hours of relentless pain, nausea, vomiting, photophobia, and phonophobia. I remember one time that the pain was incredibly severe. Several doses of prescription pain medicine were ineffectual. I do not remember falling asleep. When I woke up the next morning, the pain was still there, but not nearly as bad. My employer could not find a replacement for me, so off to work I went, dazed and still with a moderate amount of pain, nausea, and photophobia." (Anomynous, personal communication, May 14, 1999)

Migraine headaches have been described as an episodic and unpredictable chronic illness that not only has an effect upon the mental and physical health and quality of life of the migraineur, but also has an impact upon the other family members, employers, and the health care system. Migraine headaches are one of the most common diagnoses in young people evaluated by neurologists with an increased prevalence occurring between the ages of 25 and 55, the primary working years (Evans, 1996). An estimated 1 in every 10 office visits pertained to headache with the majority being for migraine (Jhingran, Osterhaus, Miller, Lee, & Kirchdoerfer, 1998). Lipton and Stewart (1997) found that 85% of women and 82% of men with moderately severe migraines had headache related disability including loss of work, inability to care for their families or fulfill social obligations. The severity of migraine attacks has been described as ranging from incapacitation requiring bedrest to a considerable reduction in work performance. "Less than half

of the migraine headache sufferers account for over 90% of the lost workday equivalents per year" (Stewart, Lipton, & Simon, 1996, p. 236).

The American Headache Survey conducted in 1989 estimated that over 23 million Americans suffered moderately severe migraine headaches (Stewart, Lipton, Celentano, and Reed, 1992). This was the first time that the International Headache Society (IHS) Diagnostic Criteria was used in a population evaluating the migraine prevalence and sociodemographic factors of migraine headaches. Approximately 17.6% of women and 5.7% of men were found to suffer from varying degrees of migraine (Stewart et al., 1992). Women were effected more than men with a ratio estimated at 3:1 during childbearing ages and a time of greatest work productivity (Lipton, Silverstein, & Stewart, 1994; Scheffield, 1998).

The migraine experience varies greatly in intensity, duration, pattern, and frequency of the headache attack, not only between different migraineurs but also with each episode in any one individual (Olesen, Tfelt-Hansen, Gadnek, & Ware, 1994). Often primary care providers have evaluated a patient's quality of life (QOL) based on the ability to function and not on the stressors or well-being from the migraineur's point of view (Cavallini, Micieli, Bussone, Rossi, & Nappi, 1995). Headaches do not affect life expectancy, but they have been observed to have a negative impact on the QOL for the sufferer. Many migraineurs live in fear of the unexpected attacks which affect the ability to work, care for families, or to meet social obligations.

Many patients seek care in emergency rooms, urgent care settings, and with primary care providers for the acute migraine attack. Often clinicians in these settings view these patients as malingerers and drug seekers, not fully understanding the impact this chronic illness has on the QOL of migraineurs. Patients are treated for the acute episode as a single event and not as part of a complex chronic pain syndrome. Analgesics are often the treatment of choice in these acute care settings for the rapid relief of the pain episode with minimal follow-up care. Many migraineurs suffer 'rebound headaches' secondary to the analgesic use and access the health care system repeatedly for temporary relief of pain (Pryse-Phillips et al., 1997). This is costly and not an optimal solution to the problem.

Positive patient outcomes could be achieved through effective management of migraines by the advanced practice nurse (APN) through (a) patient education, (b) identification of headache triggers, and (c) behavioral modification. Headache education encourages participation in self-management of chronic pain instead of sporadic medical treatment for pain control which fosters dependency on the health care system (Slater & Good, 1991). Advanced practice nurses can positively affect outcomes and QOL for the chronic headache sufferer by providing high quality, accessible, and cost-effective care (McGrath, 1990).

McGrath (1990) estimated that "50 to 90 percent of the primary care provided by physicians could be provided by [nurse practitioners] working at an annual salary of approximately one-third of the physicians" (p. 40). Nurse practitioners (NP) spend up to 65% longer time with patients, and they were noted to (a) conduct more comprehensive exams, (b) improve patient compliance with treatment plans, and (c) generate a high degree of patient satisfaction with the care given (McGrath, 1990).

The significant physical, emotional, and financial impact of migraine headache episodes on individuals, family members, employers, and the health care system, along with the documented rising number of Americans affected by migraine, supports the need to recognize migraine as a costly chronic illness (Stewart et al., 1992). Measurement of QOL is an effective tool for health care providers to (a) assess the effectiveness of various traditional and alternative interventions, (b) focus on areas of greatest concern, and (c) individualize treatment plans for the migraineur. Continuous and focused care in primary health care settings and headache specialty clinics offer migraineurs a more holistic approach to the management of migraine and positively affect QOL issues.

Purpose of Study

The purpose of this study was to determine the locus of control (LOC) and QOL in three groups of migraineurs: (a) those who had participated in a formal group headache education session, (b) those who had received headache education by other methods, and (c) those who had

not received headache education. This information could be utilized by APNs as they strive to better manage clients with severe headaches.

Literature Review

Research studies have concentrated on QOL issues in migraine. Osterhaus, Townsend, Gadnek, and Ware (1994) found that the QOL for migraineurs was considerably lower when compared to the QOL for healthy individuals. Wagner, Patrick, Galer, and Berzon (1996) found that people with a higher frequency of migraine headache episodes and those with a greater number of associated symptomatology had a lower QOL. Scharff, Turk, and Marcus (1995) found that the intensity of migraine attacks, not the diagnosis, influenced QOL of migraineurs. Durham et al. (1998) evaluated 2,949 nurses reporting migraine headaches and their perceived QOL and work productivity. These subjects missed more days from work, functioned below the standard at work, restricted home activities, and altered spousal roles during the migraine episodes.

The influence of migraine headaches on family dynamics is an important factor affecting QOL. Smith (1998) stated that migraine headaches can affect (a) family functioning, (b) parental roles, and (c) spousal relationships. Basolo-Kunzer, Diamond, Maliszewski, Weyerman, and Reed (1991) found that couples who reported having headaches also reported greater marital conflict resolution than did patients without chronic pain. In addition, "they reported greater couple differences in marital consensus, cohesion, affection, and sexual relationships" (p. 144). The impact of migraine on family dynamics and household routines was more pronounced when the primary caregiver, such as the mother, was the sufferer. Often family members would become resentful of the migraineur for not fulfilling the expected role and for refocusing the attention of the family on management of the migraine episode. Family and marital support, even though costly at the outset, would decrease the impact on family functioning.

Rokicki and Holroyd (1994) found there was a difference in headache sufferers who sought treatment as opposed to the ones who did not. Subjects with more frequent headaches of longer duration were more likely to seek treatment. Rokicki and Holroyd concluded that seeking treatment for the headache episode was determined mainly by the frequency and chronicity of the

headaches. Increased use of the medical system was negatively correlated with QOL of migraineurs and increased external LOC.

Conceptual Framework

Three interrelated constructs provide this study's framework. They include QOL, LOC, and chronic illness. Quality of life for the migraineur is influenced by (a) physiological factors, (b) coping strategies, (c) social support, and (d) LOC. "Life derives its quality from the capacity of the individual to satisfy his or her needs" (Wagner et al., 1996, p. 485). Coping with migraine headaches directly effects QOL and LOC of migraineurs. The variability of headache pain, not the diagnosis, influenced QOL among migraineurs. The way one copes with chronic illness is affected by (a) one's interpretation of the illness on life, (b) the effect of the illness to continue with normal daily activities, and (c) the ability to modify life's routines during acute episodes. According to Lazarus and Folkman (1984), "...persons are constantly changing cognition and behavior efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the person's resources" (p. 141). Scharff et al. (1995) described three levels of locus of control (LOC) that influence the perception and control of pain during the migraine episode: (a) Internal LOC refers to the belief that one's own behavior directly influences the degree of pain experienced, (b) Chance LOC referred to headaches that occurred without regard to external or internal control and were associated more frequently with depression, physical symptomatology, disability, and negative coping skills, and (c) External LOC was based on the premise that external forces, medications, and health care providers had a greater ability to control the migraine pain than the individual.

Rolland (1987) described a model for chronic illness with three dimensions: (a) type of illness, (b) time phase, and (c) family functioning. Quality of life, social obligations, and family obligations were affected differently according to the type of chronic illness and whether it was progressive, constant, or episodic. Rolland (1987) described migraine as a nonfatal, chronic disease with acute episodic exacerbations alternating with varying lengths of pain free periods. The concept of time phase concentrates on the evolution of a chronic disease with its transitions and

changing demands on the sufferer. The uncertainty of the recurrence between the time of crisis and remission is a unique feature of migraine headaches. Family functioning concentrates on the dynamics of family structure and the ability to adapt to the effects of chronic illness. Advanced practice nurses are able to involve family members in the development of a comprehensive treatment plan including patient education and family counseling. Enhancing family coping strategies can preserve family dynamics and might improve the QOL of migraineurs.

Methodology

Sample. The target population chosen for this study were known migraineurs, over the age of 18, from a neurology department at a major health maintenance organization in northern California. The subjects were clients who had been seen at the clinic within the last two years for the diagnosis and treatment of migraine. From a target population which exceeded 600 clients, a convenience sample of 355 were selected and invited to participate in the study.

Research design. A retrospective quantitative study was conducted using mailed surveys to measure the QOL and LOC among migraineurs. Packets, including a cover letter describing the research project, a medical research patient bill of rights, a demographic form, the Quality of Life Index (QLI) by Ferrans and Powers (1985), and the Headache Specific Locus of Control (HSLC) questionnaire by Martin et al. (1990) were mailed out to prospective research participants. Stamped, addressed envelopes were included for return of the questionnaires.

Packets were sent to 177 patients who had participated in a headache education session within the past two years. An additional 178 packets were mailed to migraineurs who had at least one visit with the neurologist within the past two years and had not participated in a headache education session. Although 80 surveys were returned and analyzed for demographic data, one was incomplete and could not be used for analysis of the QLI and the HSLC. Seventy-nine complete surveys were divided into three groups: (a) patients who had attended a group headache education session (n=51), (b) patients who had received individual headache education either from their primary provider or via written information (n=13), and (c) patients who stated that they had received no headache education (n=15).

Quality of Life Index. The QLI assessed patient's interpretation of QOL based on importance and satisfaction. This instrument was a two part, 34 item survey. The validity and reliability of the QLI are well established (Anderson & Ferrans, 1997; Ferrans & Powers, 1985; Ferrans & Powers, 1992). Part one measured the subjective importance of various domains of life; part two measured satisfaction with those areas. The domains of life were (a) health and functioning, (b) socioeconomic, (c) psychological/spiritual , and (d) family. Each item was answered using a six-point Likert-type scale with responses ranging from "very important" to "very unimportant" for part one and "very satisfied" to "very dissatisfied" for part two. The QLI scores were determined by correlating each response on the satisfaction scale with the corresponding response on the importance scale. An item with a high level of importance weighted against the same item with a high level of dissatisfaction gave low QLI score.

Headache Specific Locus of Control. The HSLC is a 33-item questionnaire. Each item is evaluated using five point Likert-type scale with values ranging from "strongly disagree" to "strongly agree". "The psychometric properties of the HSLC scale support its use to assess headache sufferers' beliefs about the factors that influence the onset and course of headache episodes" (Martin, et. al, 1990, p. 733).

Findings

The majority of the participants (87.5%, n=70) were females over the age of 18. This disproportionate number of female participants was consistent with most other migraine related studies such as the one done recently by Stewart, et al. (1999). Participants between the ages of 26 and 55 made up 80% (n=62) of the sample for this study. The mean age for first migraine episode among all the participants was 21.3 (SD =11). Caucasian was the predominant race of the participants (72.5%, n=58). Married participants made up 71.3% (n=57) of the sample. (Table 1). An estimated 50.1% (n=40) of the participants reported having less than six headache episodes per month. This finding is consistent with the frequency of headache episodes reported by Stewart et al. (1996) who found 43.5% of their study sample had between one and 12 episodes per year and 32.7% had between one and three episodes per month. Participants (n=20) who marked "other"

when asked about the frequency of headaches had on the average more than 10 episodes per month. Alternative methods used in the control of the headache episode included biofeedback or meditation (n=24), acupressure or massage (n=21), cold therapy (n=31), and heat in the form of heating pads, warm baths or showers (n=9).

The data were evaluated in three subgroups: (a) group education, (b) individual provider education, and (c) no formal education related to headaches. (see Table 2). The participants who received education either through a group session or individually from a provider, approximately 85% of the sample, had similar QLI values (M = 20.60 and M = 20.19, respectively). The clients who received group headache education scored higher in each of the four domains of the QLI compared to the other two subgroups. The participants who did not receive formal headache education had a lower mean QLI score of 17.17. "A 2 to 3 point difference in scores was considered a clinically significant difference for QLI" (Anderson & Ferrans, 1997, p. 365). This subgroup QLI means were between 3.66 and 3.78 points lower than the QLI means with group education in the health and functioning and the social and economic subscales, respectively. The mean scores for the health and functioning subscale were lower than the other three subscales for all three subgroups (Table 2). Clients who used either biofeedback or a form of acupressure (n=34) had means of 20.82 for the QLI, 18.94 for the health and functioning subscale, 21.73 for the social and economic subscale, 22.10 for the psychological/spiritual subscale, and 22.70 for the family subscale.

In comparison to other studies (Anderson & Ferrans, 1997; Bliley & Ferrans, 1993; Ferrans & Powers, 1985), migraine headache sufferers in this study were found to have a higher QLI (19.88) than patients with other chronic illnesses such as chronic fatigue syndrome (M = 12.58) and lower than healthy graduate students (M = 21.67) and pre-angioplasty patients (Table 3). This may indicate headache sufferers in treatment and receiving disease-specific education can improve their quality of life.

There was no statistically significant difference between the total Internal-External LOC scores (M = 94.62 - 95.67) found among the three study subgroups (Table 4). These scores

represented the degree of LOC found on a continuum between internal and external LOC with the maximum score of 165 representing the highest level of external LOC possible. Patients with a higher total score were those who sought the health care professional's assistance in headache control more often. The total LOC score was then divided into three subscales for the determination of the focus of LOC. There was no statistically significant difference of the three types of LOC found among the three subgroups of participants in this study. Clients who used either biofeedback or a form of acupressure (n=34) had a mean of 35.41 for the internal LOC score, which is 2 points higher than the sample (M = 33.42).

The HSLC tool has previously been used in patients with recurrent headache. However, this study addressed a predominantly migraine headache population referred to a neurology department. Even though the study participants had a lower internal LOC compared to previous headache studies (Martin et al. 1990; Rokicki & Holroyd, 1994; VandeCreek & O'Donnell, 1992), the internal LOC scores were higher than external and chance LOC, but these were not statistically significant. No other study was found that quantifies total HSLC as a predictor of LOC (Table 5).

Discussion

The purpose of this study was to assess the QOL and LOC of migraineurs who had (a) participated in a formal group headache education session, (b) received headache education by other methods, and (c) not received headache education. It was not surprising that the QLI scores for subjects receiving patient education either in a group session or on an individual basis were similar. The study demonstrated that patients who stated that they received no formal headache education scored lower on the QLI.

There were several study limitations. Results may be skewed by the disproportionate subgroup sample sizes. The study participants were unevenly distributed among the three subgroups with 65% who received headache education in a group setting, 16.25% who received education on a one to one basis from their primary care provider, and 18.75% who received no formal headache education. The sample chosen was from a neurology department of a major health maintenance organization. This population has sought the care of health professionals for the

management of their headaches and can easily access the health care system as needed. This study did not evaluate the population of migraineurs that have no health insurance, other types of health coverage, or those who manage their headaches at home with over the counter medicines and alternative methods.

Conclusion

This study has confirmed previous research findings (Basolo-Kunzer, et. al, 1991; Durham, et. al, 1998; Jhingran, et. al, 1998; & Wagner, et. al, 1996) that the migraine headache population is a population at risk with a chronic and episodic disabling diagnosis. Migraine headaches have a negative economic impact on the individual, family, health care system, and society, both directly and indirectly. Direct costs of migraine include (a) treatment and prevention of attacks, (b) prescription and over the counter medications, (c) health care services including emergency room care, and (d) primary care provider's fees. The number of medical and pharmacy claims of migraineurs is twice that of non-migraineurs (Green & Davis, 1996). Indirect costs include (a) reduced job effectiveness, (b) loss of wages of the migraineur and the caregiver, (c) fewer opportunities for job advancement, and (d) unwanted job changes (de Lissovoy & Lazarus, 1994). "Indirect cost to American employers were estimated at approximately $13 billion annually" (Hu, Markson, Lipton, Stewart, & Berger, 1999, p. 814).

It is within the role of the APN to function as the primary care provider for this client group. Advanced practice nurses are specifically educated and well-qualified to (a) obtain detailed histories and perform comprehensive physical assessments, (b) treat using standardized procedures and protocols, (c) collaborate with physicians regarding unusual findings, and (d) refer patients to appropriate consultants or specialty clinics (Anderson, Gillis, & Yoder, 1996). Effective guidelines for diagnosis and management of migraine headaches assists in symptom recognition and management of migraine, thus improving the QOL for the migraineur (Pryse-Phillips, et al., 1997). Helping patients manage their migraines by enhancing QOL parameters and facilitating the increase of internal LOC might well decrease the frequency or intensity of the migraine attack and its subsequent negative effect on work productivity, both for the individual and the employer.

Advanced practice nurses can be instrumental in educating these patients about preventative measures, including trigger recognition and avoidance, preventative traditional methods, and use of alternative methods (biofeedback, acupressure, and herbal wraps). Marlowe (1998) stated that "the frequency of stressful events is positively and significantly correlated with the frequency of headache and that this relationship is buffered or moderated by the level of self-efficacy with respect to cognitive, behavioral, and affective self control" (p. 665). These measures would increase self-efficacy and have a positive outcome on the QOL of the migraineur. Increased QOL and LOC might well decrease emergency room visits, reduce primary care provider appointments, and decrease pharmacy costs for analgesics and over the counter remedies. Additionally, since APNs can provide quality preventative accessible care at a lower cost, substantial savings can be achieved. These practitioners "have played a significant role in the delivery of primary healthcare and continue to demonstrate increased control over the means of health care delivery" (Glynn, 1988, p. 181). Advanced practice nurses offer a holistic approach to patient care that can positively influence QOL for the migraineur, affecting family functioning, parental roles, spousal relationships, and work productivity.

Future research studies could evaluate the influence of an intervention such as headache education on LOC and QOL using pre and post tests with migraine-specific tools. Such research would serve as a guideline in establishing effective headache education sessions concentrating on improving self-management of the migraine episode. Future studies evaluating the financial impact of utilizing APNs in the health care management of patients with chronic headaches would demonstrate the cost-effectiveness for the patient and health care system in this time of health care cost capitation. Advanced practice nurses can positively effect the quality of life for migraineurs by providing an educational intervention as part of high quality, accessible, and cost-effective primary care.

Acknowledgment

The authors gratefully acknowledge Gregory Culberson, M.D. for his consultation.

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Table 1

Sample Characteristics

	Study Sample		Group Education		Provider Education		No Education	
Sample size	80	100%	52	65%	13	16%	15	18.8%
Male	10	13%	5	10%	3	23%	2	13.3%
Female	70	88%	47	90%	10	77%	13	86.7%
Ages								
18 - 25 years	6	8%	4	8%	0	0%	2	13.3%
26 - 35 years	24	30%	15	29%	4	31%	5	33.3%
36 - 45 years	14	18%	8	15%	2	15%	4	26.7%
46 - 55 years	24	30%	16	31%	5	39%	3	20.0%
56 years and over	12	15%	9	17%	2	15%	1	6.7%
Race								
African-American	4	5%	1	2%	0	0%	3	20.0%
Asian-American	4	5%	4	8%	0	0%	0	0.0%
Caucasian	58	73%	38	73%	13	100%	7	46.7%
Hispanic	10	13%	7	14%	0	0%	3	20.0%
Native-American	1	1%	0	0%	0	0%	1	6.7%
Other	0	0%	0	0%	0	0%	0	0.0%
Declined to state	3	4%	2	4%	0	0%	1	6.7%
Marital status								
Single	12	15%	7	14%	0	0%	5	33.3%
Married	57	71%	40	77%	8	62%	9	60.0%
Separated-Divorced	9	11%	4	8%	4	31%	1	6.7%
Widowed	1	1%	0	0%	1	8%	0	0.0%
Declined to state	1	1%	1	2%	0	0%	0	0.0%
Diagnosis of migraine headache made by:								
Primary Care MD	30	38%	20	39%	5	39%	5	33.3%
Nurse Practitioner	3	4%	3	6%	0	0%	0	0.0%
Neurologist	38	48%	24	46%	6	46%	8	53.3%
Other	6	8%	3	6%	1	8%	2	13.3%
Declined to state	3	4%	2	4%	1	8%	0	0.0%
Frequency of headaches per month:								
0 - 1	6	8%	4	8%	0	0%	2	13.3%
1 - 3	17	21%	12	23%	5	39%	0	0.0%
4 - 5	17	21%	11	21%	0	0%	5	33.3%
More than 6	18	23%	10	19%	1	8%	4	26.7%
Other	20	25%	14	27%	4	31%	4	26.7%
Declined to state	2	3%	1	2%	1	8%	0	0.0%

Note. Although 80 of the surveys were used in the analysis of the demographics, only 79 completed the QLI and HSLC questionnaires and therefore qualified for the complete analyses.

Table 2

Quality of Life Index Findings

	Total Sample (n=79)	Group Education (n=51)	Provider Education (n=13)	No Education (n=15)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Overall QLI Values	19.88 (4.51)	20.60 (3.94)	20.19 (5.13)	17.17 (5.04)
Health and Functioning	18.13 (4.83)	18.86 (4.25)	18.62 (5.78)	15.20 (5.06)
Social and Economic	20.84 (4.64)	21.65 (4.35)	21.11 (5.42)	17.87 (3.90)
Psychological/Spiritual	21.20 (5.67)	21.65 (5.72)	20.84 (5.80)	19.97 (5.57)
Family	22.00 (6.70)	22.42 (6.97)	21.58 (6.45)	20.91 (6.24)

Note. The range for the overall QLI, and each of the 4 subscales is 0-30. The higher the number the better the QOL.

Table 3

Comparative Quality of Life Studies

Population	Current Study Migraineurs		Anderson&Ferrans (1997) Chronic Fatigue Syndrome		Bliley&Ferrans (1993) Pre-Angioplasty		Ferrans&Powers (1985) Graduate Students	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Overall QLI Values	19.88	(4.51)	12.56	(4.97)	20.32	(3.36)	21.67	(3.68)
Health and Functioning	18.13	(4.83)	8.49	(4.60)	17.23	(5.15)	21.38	(4.02)
Social and Economic	20.84	(4.64)	15.66	(6.10)	21.94	(3.12)	22.30	(4.25)
Psychological/Spiritual	21.20	(5.67)	12.77	(6.89)	22.27	(5.26)	22.34	(4.74)
Family	22.00	(6.70)	18.17	(7.36)	25.23	(4.88)	23.08	(4.82)

Note. The range for the overall QLI, and each of the 4 subscales is 0-30. The higher the number the better the QOL.

Table 4

Headache Specific Locus Of Control Results

	Total Sample (n=79)	Group Education (n=51)	Provider Education (n=13)	No Education (n=15)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Internal-External	95.32 (15.07)	95.39 (14.00)	94.62 (18.47)	95.67 (16.19)
External LOC	31.41 (7.17)	32.06 (7.08)	29.15 (7.47)	31.13 (7.27)
Chance LOC	31.56 (9.39)	31.25 (9.62)	32.85 (8.74)	31.47 (9.64)
Internal LOC	33.42 (10.91)	33.57 (10.06)	33.38 (14.21)	32.93 (11.33)

Note. The range for the Internal-External score is 33-165. The lower the number the more internal the locus of control and the higher the number the more external the locus of control. The range of all the subscales is 11-55.

Table 5

Comparative Locus of Control Studies

Population	Current Study Migraineurs	Rokicki & Holroyd (1994) Recurrent Headache	VandeCreek & O'Donnell (1992) Recurrent Headache	Martin et al. (1990) Recurrent Headache
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
External LOC	31.41 (7.17)	23.14 (6.91)	30.60 (6.60)	23.50 (8.00)
Chance LOC	31.56 (9.39)	28.66 (6.89)	32.60 (8.30)	28.00 (7.80)
Internal LOC	33.42 (10.91)	36.46 (5.49)	33.60 (9.90)	40.20 (7.50)
LOC I-E Score	95.32 (15.07)			

Note. The range for the Internal-External score is 33-165. The lower the number the more internal the locus of control and the higher the number the more external the locus of control. The range of all the subscales is 11-55.